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(54) DOUBLE WALL CUPS

(71) We, ILLINOIS TOOL WORKS INC., a corporation organized under the laws of the State of Delaware, United States of America, of 8501 West Higgins Road, Chicago, Illinois 60631, United States of America, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

An important object of the present invention is to provide double wall insulating cups having inner and outer ribs and flutes constructed for enhancing the insulating qualities of the cup. Preferably they are also constructed for facilitating alignment of a plurality of cups when placed in a stack, so as to promote uniform nesting in a compact manner.

A double wall cup according to this invention includes an inner member and an outer member secured together, these members respectively including an inner side wall and an outer side wall, each side wall including a plurality of generally vertically extending and radially outwardly projecting ribs in a circumferential series, each rib having a generally hollow-V-shaped transverse cross-sectional configuration, each inner rib projecting into the interior of a respective outer rib, but leaving an insulating air space between the exterior of the crest of the inner rib and the interior of the crest of the outer rib.

The accompanying drawings show some examples of cups according to the invention. In these drawings:—

Figure 1 is an elevational view showing a first cup incorporating features of the present invention;

Figure 2 is an enlarged fragmentary sectional view taken generally along line 2—2 in Figure 1 and further showing in broken lines, the manner in which a second cup is adapted to nest within the first cup;

Figure 3 is a side elevational view of a

second cup structure embodying another modified form of the present invention;

Figure 4 is an enlarged fragmentary sectional view taken along line 4—4 in Figure 3;

Figure 5 is an enlarged fragmentary sectional view taken along line 5—5 in Figure 3, showing the inner cup member from within; and

Figure 6 is a fragmentary sectional view similar to Figure 4, but shows a modification.

The cup 10b shown in Figures 1 and 2 comprises an inner cup member 12b and an outer cup member 14b. These cup members are preferably formed from a suitable material in one piece and without seams. For example, a high impact polystyrene plastics material has been found to be especially suitable.

The outer cup member 14b has a side wall 20b of inverted generally frusto-conical configuration. A lower margin of the side wall merges with a transverse bottom wall 22b. The inner cup member has a side wall and a bottom wall which is preferably spaced from the outer bottom wall so as to define an insulating air space therebetween. Upper margins of the inner and outer side walls are rolled together to form an upper end rim 30b which secures the inner and outer cup members together.

The outer side wall 20b is formed with flutes 54b and ribs 56b having a substantially V-shaped configuration as shown best in Figure 2, and the inner side wall is formed with somewhat similar flutes and ribs 58b and 60b. The V-shaped outer and inner ribs 56b and 60b extend all the way from the bottom of the cup upwards across the gripping portion to points adjacent the upper margin of the cup. The ribs and flutes nest within each other as shown in Figure 2. The ribs 56b have crest portions which project substantially radially outwardly from crest portions of the

ribs 60b so as to define insulating air spaces 62b therebetween.

When a plurality of the cups are stacked, the crests of the outer ribs 56b of one cup are adapted to project into and nest within the V-shaped grooves at the inner sides of the ribs 60b of an immediately adjacent cup as shown in broken lines in Figure 2. Thus, a plurality of cups may be stacked or nested together in a relatively compact manner.

Preferably the outer ribs 56b have a sharper V-shaped configuration than the inner ribs 60b. In other words, the included angle between the sides of the ribs 56b is less than the included angle between the sides of the ribs 60b. This facilitates entry of the outer ribs into the inner ribs during stacking or, in other words, aids in rendering the cups self-aligning.

The cup 10 shown in Figures 3 to 5 has inner and outer lower wall sections formed with flutes and ribs 58, 60 and 54, 56, similar to those shown in Figures 1 and 2. In fact a section of Figure 3 on the line X—X is the same as Figure 2.

The cup 10 also has a portion 32 intermediate upper and lower marginal portions of the side walls and providing a primary gripping section which is to be engaged by the hand of a user. In order to insulate the outer surface of the cup from the interior and thereby protect the hand of the user, the outer wall is formed with inwardly projecting flat flutes 34 separated by flat-crested ribs 36, which ribs extend substantially axially along the length of the portion 32. In addition, the inner cup member wall is formed with flat flutes 38 separated by flat-crested ribs 40. In this embodiment the inner and outer flutes and ribs are aligned with each other so as to define insulating air spaces 42 and 44 therebetween. With this construction, the cup is insulated entirely around its periphery, and the ribs 36 present broad smooth surfaces which may be comfortably grasped in the hand of a user. In most instances, the user's hand will engage only the ribs 36. The ribs 40 are slightly wider than the ribs 36, to permit nesting of stacked cups as described below and shown in broken lines in Figure 4.

The inner and outer walls are formed with annular wall sections 43 and 45 at the lower margin of the gripping portion, merging with inwardly projecting annular shelf sections 46 and 48. These sections respectively merge with the inner and outer lower wall sections 50 and 52.

Engagement between ribs 56 and 60 serves to orientate the inner and outer members rela-

tive to each other so as to obtain the desired relationship between the ribs 36 and 40.

As previously indicated, the V-shaped configuration of the outer ribs 56 is sharper than that of the inner ribs 60. In addition, the construction of the inner ribs 60 is such that the internal grooves provided thereby have relatively wide and flaring mouths 64 as shown in Figure 5. These mouths are in alignment with the internal grooves provided by the ribs 40 in the gripping portion of the container. Therefore when one cup is inserted within another during a stacking operation, preliminary alignment between the cups may first be obtained by engagement of at least a portion of the ribs 56 within the internal grooves defined by the ribs 40, and final alignment will be obtained as these ribs pass downwardly through the mouths 64 and enter into the grooves defined by the ribs 60.

In the modification shown in Figure 6, the outer and inner ribs 36a and 40a are circumferentially offset from each other. In other words, whereas in Figure 4 the ribs 36 and 40 are in alignment with each other, and the generally radially extending wall portions of these ribs are in substantial alignment, in Figure 5, the inner ribs 40a are in alignment with and abut the surfaces of the flutes 34a. This arrangement increases the radial dimension of the insulating air pockets 44a.

WHAT WE CLAIM IS:—

1. A double wall cup including an inner member and an outer member secured together, these members respectively including an inner side wall and an outer side wall, each side wall including a plurality of generally vertical extending and radially outwardly projecting ribs in a circumferential series, each rib having a generally hollow-V-shaped transverse cross-sectional configuration, each inner rib projecting into the interior of a respective outer rib, but leaving an insulating air space between the exterior of the crest of the inner rib and the interior of the crest of the outer rib.

2. A cup according to claim 1, in which the ribs of the outer side wall have an included angle which is less than that of the ribs of the inner side wall.

3. A cup according to claim 1 or claim 2, in which the ribs extend all the way from the bottom of the cup to adjacent to the upper margin of the cup.

4. A cup according to claim 1 or claim 2, in which the ribs are in lower wall sections only.

5. A cup according to claim 4, in which, in a gripping section there are flat-crested ribs spaced circumferentially by flat flutes.

6. A cup, as defined in claim 1, substantially as described with reference to Figures 1 and 2, Figures 3 to 5, or Figure 6 of the accompanying drawings.

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